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ABSTRACT

This study examined the effectiveness of the addition of a cognitive intervention based on individualized assessment to a behavioral intervention for obesity. Overweight subjects (N=63) were randomly assigned to either a behavioral intervention or a behavioral intervention combined with a cognitive intervention which focused on changing specific maladaptive self-statements related to weight loss. Physiological, behavioral, and cognitive measures were used to assess change between pretest, posttest, and 3-month follow-up. The hypothesis that behavioral and cognitive intervention would result in greater weight loss and reduction in body fat than the behavioral intervention alone was not supported at posttest or at follow-up. The hypothesis that both treatments would show significant differences between time points on behavioral measures was supported. Two hypotheses examined the construct validity of the cognitive intervention and the generalizability of the cognitive intervention. Both conditions showed changes over time on cognitive measures, but differences between the treatments were not significant. Future research on the effectiveness of cognitive interventions in the area of weight loss should include measures other than those that are weight-related, longer follow-ups, and sufficient amounts of cognitive therapy to allow clients to fully integrate the cognitive dialogues into their everyday lives. (Author/NB)

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The Addition of an Individualized Cognitive Intervention to a Standardized Behavioral Intervention for Obesity

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ABSTRACT

This study examined the effectiveness of the addition of a cognitive intervention based on individualized assessment to a behavioral intervention. Sixty-three subjects who were atleast 15% overweight were randomly assigned to one of two conditions: a behavioral intervention or a behavioral intervention and a cognitive intervention focused on changing specific maladaptive self-statements related to weight loss.

Physiological, behavioral, and cognitive measures were used to assess change between pretest, posttest, and three-month follow-up.

Four hypotheses were examined in this study. The first, which predicted that behavioral and cognitive intervention would result in greater weight loss and reduction in body fat than the behavioral alone intervention at posttest and at follow-up, was not supported. The second hypothesis, which predicted both treatments would show significant differences between time points on behavioral measures, was supported. The third examined the construct validity of the cognitive intervention and the fourth hypothesis examined the generalizability of the cognition intervention. Both conditions showed changes over time on cognitive measures, but differences between the treatments were not significant.

Based on the results of this study, it is suggested that future research examining the effectiveness of cognitive interventions in the area of weight loss include measures other than those that are weight related, longer follow-ups to assess long-term maintenance, and sufficient amounts of cognitive therapy so that clients have fully integrated the newly learned cognitive dialogues into their everyday lives.

Obesity is now considered to be a first order public health hazard (Berger, Berchtold, Gries, & Zimmerman, 1980). The prevalence of obesity, the seriousness of the physiological consequences of being obese, and the resistance to successful treatment contribute to the labeling of obesity as a major challenge to the medical and psychological communities (Brownell, 1982). Approximately a quarter of all adult Americans are at least 20% above ideal weight (Wadden & Stunkard, 1986). Weight reduction goals exist for about half of the American population (Abrams, 1979); 53% of the adult population surveyed in 1980 reported efforts to control weight (Hodgson, 1984).

Behavioral Approaches to Treatment of Obesity

Two assumptions underlying behavioral treatment programs are (1) obesity is the result of a positive energy balance due to overeating and/or underexercising and (2) maladaptive patterns of eating and activity patterns are maintained by antecedents and consequences which can be manipulated to change the maladaptive patterns (Bellack, 1975). Thus, behavioral programs treat obesity primarily as a behavioral problem which is the result of environmental factors leading individuals to overeat and/or underexercise (Foreyt, Mitchell, Garner, Gee, Scott, & Gotto, 1982).

In 1976, Stunkard and Mahoney commented that behavioral techniques had demonstrated superiority over all other treatment modalities for the treatment of mild to moderate obesity. This initial enthusiasm for behavioral programs has subsided as follow-up assessments of treatment outcome have been less favorable (Stalonas, Perri, & Kerzner, 1984). Kazdin and Wilson (1978) in Evaluation of behavior therapy stated, "the amount of weight lost has rarely been clinically significant, outcome has been marked by

considerable and unaccounted for inter-individual variability and long term evaluations of treatment efficacy have been conspicuously lacking." (p. 19).

Long-term success with the behavioral approaches may be achieved if participants continue to follow the principles learned during the program (Mahoney, 1974; Stalonas, 1980; Gotestam, 1979) Stalonas, Perri, & Kerzner, 1984). Thus, the major problem facing behavioral researchers concerns the facilitation of continued adherence to behavioral strategies to facilitate further weight loss and maintenance (Foreyt et al., 1982).

The addition of cognitive therapy

Combinations of cognitive and behavioral therapy have been shown to be effective treatments in various specific problem areas, e.g. depression and anxiety. A combination of behavioral and cognitive techniques may be more effective than behavior therapy alone in the area of weight loss. Polly, Turner, and Sherman (1976) concluded that the "one thing that is missing in current weight loss programs is direct attention to the 'inside story' -- those unreasonable and illogical premises and standards coupled with those excessively self-critical thoughts and images of clients that can sabotage self-control programs" (p. 342). Mahoney and Mahoney (1976), Krumboltz and Thoresen (1975), and Craighead (1985) suggest that effective weight loss programs should include elements of both behavioral and cognitive change in order to be effective in the long run.

Cognitive interventions for weight loss focus on perfectionist performance standards (I'll never eat another doughnut again), maladaptive self-statements (I've failed again), eliminating the idea

of a temporary diet and lists of forbidden food (I'm on a diet for the next two weeks and can't eat any sweets), justifications for eating (I didn't eat lunch so it's okay to eat this snack), inability to distract from food thoughts, and impatience with slow rates of weight loss (I'll never get down to goal weight) (Craighead, 1985; Mahoney & Mahoney, 1976a; Mahoney & Mahoney, 1976b). Changing these irrational beliefs, unrealistic standards, and negative evaluations may help people not to become discouraged by the slow rate of weight loss in behavioral programs.

The need for individual assessment and treatment within a group setting was also needs to be taken into consideration. Wilson and Brownell (1980) state that "often programs are not individually tailored. In many cases, procedures have been assigned without regard for clients' desire or need for them" (p.57). Consequently, individual assessment of clients' patterns of thinking about weight loss was conducted in the beginning phase of the program so that later cognitive restructuring interventions were individually tailored to participants' own thought patterns.

The purpose of this study was to assess the effectiveness of the addition of a cognitive component to a standardized behavioral weight loss program.

Research Hypotheses

The hypotheses were as follows:

(1) Cognitive Restructuring related to weight loss as the key component of weight loss: Those people in the treatment condition that included the cognitive component
   (A) would lose more weight initially
   (B) would maintain more of their weight loss.

(2) Construct validity of the behavioral intervention: All

three conditions would show significant differences between their pre and posttest scores on the behavioral assessment measures.

(3) Construct validity of the cognitive intervention: The treatment condition that included the cognitive component would show significant differences between pre and posttest scores on the cognitive assessment measures related to weight loss.

(4) Generalizability of the cognitive interventions: The treatment condition that included the cognitive component would show significant differences between pre and posttest scores on cognitive assessment measures in related areas, specifically attitudes about themselves and relationships.

METHOD

Subjects and Procedure

Subjects were 56 women and 7 men recruited through announcements in a university newsletter. All participants were at least 15% over ideal weight as compared to the Metropolitan Height Weight Table (1983). The average age was 43.62 years old; the average number of pounds overweight was 57.70.

During an initial assessment interview, physiological measures were obtained. Subjects were then blocked on sex and initial weight and randomly assigned to one of two intervention conditions: the standard behavioral intervention alone (BI), or the individualized cognitive intervention and the standard behavioral intervention (BI+CI). Each intervention group was made up of approximately eight subjects and a group leader. Three group leaders, doctoral students in counseling psychology, were trained to lead both types of treatment. Each of the intervention conditions met weekly for one 75 minute session for 10 weeks.

Treatment Conditions

The behavioral interventions followed the program outlined by Ferguson (1975). The focus of these procedures is on changing inappropriate eating patterns and habits, particularly those

associated with external cues of hunger.

The cognitive intervention groups spent part of each session focusing on different types of cognitive attributions that might affect people's rates of weight loss (e.g. hopelessness, motivation, physical attribution.) The information presented was based on Mahoney and Mahoney (1976)'s Permanent Weight Control. Subjects in this intervention condition received a printout of their answers to the statements on the cognitive scales on the Master Questionnaire with paragraphs about alternative ways of thinking for those questions answered incorrectly. These printouts along with information from Mahoney and Mahoney (1976) were used as the basis for the cognitive interventions made within this treatment condition.

Measures

Physiological, behavioral, and cognitive measures were obtained prior to and immediately following intervention and at follow-up. Follow-up was conducted at the end of a three month period.

Physiological Measures. Subjects were weighed, body height measured, and body frame size determined during initial screening. Weight, height, and body frame were compared to the 1983 Metropolitan Weight Height Table and a percentage of overweight calculated.

A measure of body fat was determined using skin calipers. Measures of body fat were be taken from four sites on the body: triceps, biceps, subscapula, and suprailiac skinfolds (Dintiman, Stone, Pennington, & Davis, 1984).

Behavioral Measures. Participants in the study were given a self-report questionnaire (SREBQ) constructed by the researcher which focused on specific eating behaviors, such as techniques that slow down eating, alternative activities to eating, etc. Subjects were

asked to rate the percentage of time each intervention strategy was used (0 to 100%). A behavioral technique usage percentage was calculated by summing the rating of percentage of time used for each technique and dividing by the total number of techniques to get a mean percentage of use. Internal consistency of the instrument was tested with a Cronbach's Alpha coefficient being calculated at .8491.

The Eating Styles Questionnaire (Wilson, 1986) (ESQ) was used to assess the degree of stimulus control and behavioral patterns of the participants. Categories include emotional eating, daily drinking, gourmet cooking, nibbling, boredom eating, physical activity, binge eating, high calorie eating, high visibility eating, and self-control. The questionnaire presents a series of situations and the subject is asked to identify which statements describe their attitudes about eating.

The Master Questionnaire (Straw et al., 1984) (MQ) stimulus control and energy balance scales were used to assess behavioral effects of the weight loss interventions. The items are presented as statements to which subjects respond each item by circling true or false depending on whether they agree or disagree with the statement.

Cognitive Measures. The MQ hopelessness, motivation, and physical attribution scales (Straw et al., 1984) were used to assess cognitive attributional changes relating to thoughts about weight loss.

A questionnaire designed by the investigator was used to assess negative thoughts about losing weight as suggested by Ray (1981) (RQ). High scores on this measure are indicative of negative thinking about weight loss.

Several related measures of cognitive attributions were administered to assess the generalizability of the cognitive intervention strategy. These included the Dysfunctional Attitudes Scale (Weissman, 1978) (DAS) and the Relationship Belief Inventory (Eidelson & Epstein, 1982) (DAS). The DAS was used to assess cognitive distortions related to the world in general and RBI was administered as a measure of cognitive attributions about relationships.

RESULTS

Repeated measures MANOVA's were used to test the four hypotheses. Significant multivariate main effects and interactions were followed by univariate analyses and contrasts to determine significant differences between cell means on individual measures. Independent variables in the MANOVA included therapist, treatment condition, and time; when the therapist factor was nonsignificant, analyses were collapsed across the therapist factor and the MANOVA was rerun with treatment and time as independent variables.

Analyses of variance (ANOVA's) were run on pretest characteristics relevant to weight loss and pretest scores on the physiological, cognitive, and behavioral measures to ensure that the treatment conditions and the individual weight loss groups were not significantly different from each other at pretest. ANOVA's were also run on expectations, number of sessions attended, and number of homework assignments completed to rule out these factors as potential covariates of weight loss.

Hypothesis One predicted that subjects in the BI+CI condition

would lose more weight at posttest and maintain more of their weight loss at follow-up than the BI condition. This hypotheses was not supported by a significant multivariate treatment main effect, $F(7,39) = .69$ $p < .68$, or a significant treatment by time interaction, $F(14,32) = .79$, $p < .676$. The time main effect was significant, $F(14,32) = 11.34$ $p < .001$, indicating that changes between pretest and posttest and follow-up were significant, regardless of treatment condition. Weight, number of pounds lost, number of pounds overweight, pounds lost/ pounds overweight, and Feinstein's reduction quotient changed significantly from pretest to posttest and from pretest to follow-up. Hypotheses One was not supported by the results of this study.

Hypothesis Two predicted that both treatment conditions, BI and BI+CI, would show significant change from pretest to posttest and follow-up on the behavioral measures. Results indicated significance for the therapist main effect, therapist by time interaction, therapist by time by treatment interaction, and the time main effect, all $F's > 1.95$, all $p's < .024$. Univariate analyses and individual contrasts revealed no systematic bias on the therapist factor. The multivariate time main effect, univariate analyses and contrasts indicated significant differences between pretest and posttest means and between pretest and follow-up means for all behavioral measures. Hypothesis Two was supported by significant differences on behavioral measures between pretest and posttest treatment assessments.

Hypothesis Three examined the construct validity of the cognitive intervention. It was predicted that the BI+CI condition would change significantly from pretest to posttest and follow-up on the cognitive measures related to weight loss. Hypothesis Three was

not supported by the results of the MANOVA; there was no significant main effect, $F(16,30) = .561$ $p < .888$, or interaction effect involving treatment, $F(32,14) = 1.354$, $p < .278$. The time effect was significant, $F(32,14) = 3.201$ $p < .012$; significant differences were reported between pretest and posttest and follow-up means for hopelessness, motivation, physical attribution subscales of the MQ and the RQ. While the differences between treatment condition means were not significant, plotting of the means suggests that greater changes may have occurred in the BI+CI condition between pretest and posttest and follow-up measurements.

Hypothesis Four predicted that subjects in the BI+CI condition would display significant changes from pretest to posttest and follow-up on the related cognitive measures. Nonsignificant treatment effects, $F(16,30) = .561$ $p < .888$, and treatment by time interaction effects, $F(32,14) = 1.354$ $p < .278$, did not support this hypothesis. However, as with Hypothesis Three, the main effect for time was significant. Univariate analyses and individual contrasts indicated that means for several subscales differed significantly from pretest to posttest and from pretest to follow-up. Individual contrasts between time points suggested that differences between pretest and posttest means for the DAS approval, love, achievement, omnipotence, and autonomy subscales and the RBI disagreement is destructive and partners cannot change subscales. Pretest and follow-up means were also found to be significantly different for the love, approval, disagreement is destructive and partners cannot change subscales. Plotting of the means for the approval, omnipotence, autonomy, and disagreeement is destructive subscales suggest that the BI+CI condition changes were greater than for the BI condition, though

the differences are nonsignificant.

Discussion

The findings of this study did not provide support for the added effectiveness of a cognitive component to a behavioral weight loss program in terms of weight loss and reductions in body fat. Several explanations may explain these results. The effects of cognitive therapy may not result in greater initial weight loss but may lead to greater weight loss over time. Consequently, longer follow-up than three months may be useful in detecting the effectiveness of cognitive therapy as a weight loss technique. This may be true because cognitive therapy is aimed at helping people to develop realistic expectations about weight loss, such as how to think differently about how quickly and how much weight they need to lose, thus preventing discouragment which can lead to binge eating when confronted with unobtainable weight loss goals. Consequently, longer follow-up than three months may be useful in detecting the effectiveness of cognitive therapy as a weight loss technique.

Limiting the scope of outcome measures to weight and derivatives of weight may also interfere with a thorough assessment of the effects of cognitive interventions that may occur in areas other than weight. Measures of cognitions related to weight loss, such as the Master Questionnaire, can be use for this purpose.

Another explanation is that the amount of cognitive therapy used in this study was not sufficient to produce desired changes. It has been suggested that more than seven hours of cognitive therapy are necessary in order to integrate the principles of cognitions and their

effects on behavior; this study included only about 150 minutes of cognitive therapy, less than 20 minutes per session. It has also been suggested that cognitive therapy should be implemented at specific points in the intervention process. Kilmartin and Robbins (1987) suggest cognitive therapy in the beginning of treatment focusing on realistic expectations about weight loss while Craighead (1985) suggests a focus on relapse prevention near the end of treatment.

Support was found for the hypothesis that behavioral interventions would affect the eating behaviors of participants. The amount of positive eating behaviors were reported to be increased and the number of bad eating habits decreased. Findings suggest that the behavioral interventions possess a degree of construct validity. Future research is needed to incorporate observations of actual eating behavior in a variety of environmental situations to further validate the relationshilp between decreases in maladaptive eating behavior and behavioral interventions. It may useful to look at how the perceived effectiveness of behavioral techniques changes over time since Forster and Jeffrey (1986) suggest that weight loss and maintenance involve different processes.

One hypothesis tested the construct validity of the construct validity of the cognitive intervention. The results suggest that cognitions change significantly over time, regardless of treatment. The fact that behavioral treatment had a positive effect on cognitions related to weight loss concurs with other research findings, a change in behavior exerts an effect on cognitions. Plotting the means of the treatment groups indicates that the cognitive intervention group did show greater improvement in terms of cognitive change than the behavioral intervention, though the differences were not significant.

This again may indicate that the strength of cognitive intervention was not sufficient to result in statistical significance.

The generalizability of the cognitive intervention was also assessed in this study. The results for this hypothesis were similar to those of the hypothesis examining the construct validity of the cognitive intervention. Both interventions groups experienced significant reductions in general maladaptive cognitions as well as cognitions related to weight loss.

Future research examining the effectiveness of cognitive interventions in the area of weight loss should include measures other than weight related ones. Longer follow-ups are necessary to assess long-term weight loss maintenance. Finally, a greater amount of cognitive therapy should be used to enable clients to fully integrate the newly learned cognitive dialogues into their everyday life.

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